

no. 56

WELL-SAMPLE RECORD NO.56

PENNSYLVANIA GEOLOGICAL SURVEY

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JESSE B. MILLER NO.1 WELL NAPIER TOWNSHIP, BEDFORD COUNTY

By

Chas. R. Fettke



COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF INTERNAL AFFAIRS

GENEVIEVE BLATT, *Secretary*

TOPOGRAPHIC AND GEOLOGIC SURVEY

CARLYLE GRAY, *State Geologist*

1960

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY

March 1953

WELL-SAMPLE RECORD

JESSE B. MILLER No. 1 WELL
APPALACHIAN BASIN ASSOCIATES

Bedford County, Pa., Napier Township

Bedford Quadrangle: 1.60 miles north of 40° 05' N. Lat. and 1.89 miles
west of 78° 35' W. Long.

Completed: March 20, 1952

Elevation: 1666 feet above sea level

Total Depth: 8979 feet

Deepest formation: Bellefonte dolomite

Result: Salt water in Tuscarora sandstone at 2920 feet, 3 bailers in 2
hours, at 2938 feet, rose 1500 feet in hole, at 3046-3051, rose
2700 feet in hole; very small gas pockets in Reedsville shale
at 6866, 6872, and 6898 feet; 600,000 cubic feet of sour gas per
day in Bellefonte dolomite at 8870 feet exhausted before well
was completed.

Samples: 0 to 8979 feet examined by Chas. R. Fettke

Thickness Feet	Description of Strata	Depth in feet
<u>DEVONIAN SYSTEM, 112 + feet</u>		
<u>Lower Devonian Series, 112 + feet</u>		
<u>Shriver formation, 43 + feet</u>		
43	Siltstone, dark-gray, in part somewhat calcareous, weathers to a light yellowish brown	0 - 43
<u>Helderberg group, 69 feet</u>		
14	Shale, dark-gray, silty, and in part somewhat calcareous	43 - 57
7	Shale, dark-gray, silty and calcareous, containing occasional fragments of shells, mostly brachiopods	57 - 64
7	Limestone, dark-gray to grayish-black, arillaceous and silty, containing occasional fragments of shells, mostly brachiopods	64 - 71

Thickness Feet	Description of Strata	Depth in feet
6	Limestone, gray to dark-gray, argillaceous and silty	71 - 77
10	Limestone, very fine, gray, containing a great deal of light-gray to white semichalcedonic chert and some brownish-gray subchalcedonic chert	77 - 87
5	Limestone, very fine, dense, brownish-gray, somewhat silty and argillaceous, containing a little light-bluish-gray chalcedonic chert	87 - 92
20	Limestone, very fine, dense, brownish- to dark-brownish-gray, somewhat silty and argillaceous	92 - 112

SILURIAN SYSTEM, 3656 feet ?

Upper Silurian or Cayugan Series, 1620 feet

Keyser limestone, 135 feet

11	Limestone, very fine, dark-gray, silty and argillaceous, platy and in part finely laminated	112 - 123
9	Limestone, very fine, gray, silty, argillaceous and somewhat magnesian	123 - 132
32	Limestone, very fine, dense, dark-brownish-gray, somewhat silty, argillaceous and magnesian, containing some coarse, crystalline, white calcite	132 - 164
23	Limestone, very fine, gray, silty argillaceous and somewhat magnesian, containing a great deal of coarse, crystalline, white calcite	164 - 187
7	Limestone, very fine to fine, crystalline, brownish-gray, containing some coarse, crystalline, white calcite	187 - 194
6	Limestone, very fine, in part crystalline, brownish-gray, somewhat silty, argillaceous, and magnesian, containing a little brownish-gray chalcedonic chert and some coarse, crystalline, colorless to white calcite	194 - 200
6	Limestone, very fine, gray, somewhat silty and argillaceous, containing fragments of shells, including crinoids, and some coarse crystalline, white calcite	200 - 206

Thickness Feet	Description of Strata	Depth in feet
8	Limestone, very fine to fine, crystalline, brownish-gray, somewhat argillaceous, containing occasional fragments of shells, including bryozoa	206 - 214
13	Limestone, very fine, dense, gray to brownish-gray, argillaceous and silty, containing an occasional shell fragment	214 - 227
6	Limestone, very fine to fine, in part crystalline, brownish-gray, containing occasional fragments of shells	227 - 233
6	Limestone, very fine to fine, in part crystalline, brownish-gray, containing fragments of shells and a great deal of white tripolitic chert with numerous micro-fossil molds and a little light-bluish-gray chalcedonic chert	233 - 239
8	Limestone, very fine to medium, crystalline, gray to brownish-gray, containing abundant fragments of shells	239 - 247
<u>Tonoloway limestone, 806 feet</u>		
21	Limestone, very fine, lithographic, brownish-to dark-brownish-gray, slightly argillaceous	247 - 268
35	Limestone, very fine, dense, brownish-to dark-brownish-gray, somewhat argillaceous and, in part, minutely laminated	268 - 303
23	Limestone, very fine, crystalline, light-gray to brownish-gray, somewhat argillaceous, and sandy, containing some coarse, crystalline, white calcite in middle part	303 - 326
49	Limestone, very fine, dense, brownish-gray, somewhat argillaceous and silty, <u>FRESH WATER encountered at 360 feet</u>	326 - 375
13	Limestone, very fine, dense, dark-gray, somewhat argillaceous	375 - 388
6	Limestone, very fine, crystalline, dark-brownish-gray, argillaceous, silty and somewhat magnesian	388 - 394

Thickness Feet	Description of Strata	Depth in feet
4	Limestone, very fine, dense, dark-gray, somewhat argillaceous	394 - 398
10	Limestone, very fine, gray, shaly and somewhat dolomitic	398 - 408
38	Limestone, very fine, dark-brownish-gray, argillaceous, silty, and somewhat magnesian	408 - 446
10	Limestone, dark-gray, shaly, containing calcite veinlets	446 - 456
16	Limestone, very fine, dark-gray, argillaceous, containing cross-fiber calcite veinlets	456 - 472
13	Limestone, very fine, dark-brownish-gray, argillaceous and somewhat silty	472 - 485
5	Shale, dark-gray, very calcareous and somewhat magnesian	485 - 490
5	Limestone, very fine, dark-brownish-gray, argillaceous, containing some minute drusy calcite crystals	490 - 495
49	Limestone, very fine, dense, brownish-gray, to dark gray, argillaceous and magnesian, in part finely laminated	495 - 544
30	Limestone, very fine, dense, brownish- to dark-brownish-gray, magnesian and somewhat argillaceous, in part finely laminated, containing <u>a little anhydrite and gypsum</u>	544 - 574
24	Limestone, very fine, dense, brownish- to dark-brownish-gray, argillaceous and somewhat magnesian	574 - 598
15	Limestone, very fine, dense, dark-brownish-gray, argillaceous and somewhat magnesian, containing abundant micro-fossils, mostly ostracods in upper part	598 - 613
63	Limestone, very fine, dense, dark-gray, argillaceous and somewhat magnesian, finely laminated in lower part, containing <u>a little anhydrite</u>	613 - 676

Thickness Feet	Description of Strata	Depth in feet
9	Limestone, very fine, crystalline, dark-brownish-gray, argillaceous and magnesian	676 - 685
37	Limestone, very fine, dense, dark-gray, argillaceous, containing occasional fragments of shells in upper part	685 - 722
22	Limestone, very fine, dense, brownish-gray to dark-gray, dolomitic, somewhat argillaceous, in part finely laminated, containing a <u>great deal of anhydrite</u>	722 - 744
17	Limestone, very fine, dense, dark-gray, argillaceous and somewhat magnesian, in part finely laminated	744 - 761
6	Dolomite, very fine, dense, gray, somewhat argillaceous, containing a <u>great deal of anhydrite</u> , intersected by white calcite veinlets	761 - 767
50	Limestone, very fine, dense, dark-gray, somewhat argillaceous and magnesian, containing <u>considerable anhydrite</u>	767 - 817
4	Limestone, very fine, crystalline, dark-brownish-gray, somewhat argillaceous and magnesian, containing a <u>great deal of anhydrite</u>	817 - 821
13	Limestone, very fine, dense, gray to dark-gray, argillaceous and somewhat magnesian, in part minutely laminated, containing a <u>little anhydrite</u>	821 - 834
28	Shale, gray to dark-gray, calcareous	834 - 862
21	Limestone, very fine, dense, dark-gray, argillaceous and somewhat magnesian, containing a <u>little anhydrite</u>	862 - 883
11	Limestone, gray to dark-gray, somewhat magnesian, containing a <u>little anhydrite and gypsum</u>	883 - 894
8	Limestone, very fine, dense, gray to dark-gray, argillaceous	894 - 902

Thickness Feet	Description of Strata	Depth in feet
13	Limestone, very fine, dense, gray to dark-gray, somewhat argillaceous	902 - 915
54	Limestone, very fine, dense, gray to dark-gray, somewhat argillaceous and magnesian, containing a <u>little anhydrite and gypsum</u>	915 - 969
13	Limestone, very fine, dense, brownish-gray, argillaceous and somewhat magnesian, containing <u>some anhydrite</u>	969 - 982
3	Limestone, very fine, crystalline, brownish-gray, somewhat magnesian, containing a <u>little anhydrite</u>	982 - 985
14	Limestone, very fine, dense, brownish- to dark-brownish-gray, argillaceous and somewhat magnesian	985 - 999
18	Limestone, very fine, dense, very dark-gray argillaceous and somewhat magnesian, containing <u>considerable anhydrite</u>	999 - 1017
19	Limestone, brownish-to dark-brownish-gray, shaly	1017 - 1036
14	Shale, light-gray, slightly calcareous, with some interbedded very fine, crystalline, dark brownish gray dolomitic limestone containing <u>some anhydrite</u>	1036 - 1050
3	Limestone, very fine, crystalline, brownish-gray, dolomitic	1050 - 1053
<u>Wills Creek shale, 627 feet</u>		
12	Shale, light-greenish-gray, somewhat calcareous	1053 - 1065
17	Shale, light-gray to gray, somewhat calcareous	1065 - 1082
22	Shale, dark-gray, somewhat calcareous, with some interbedded, very fine, dense, brownish-gray argillaceous limestone containing microfossils, including ostracods	1082 - 1104

Thickness Feet	Description of Strata	Depth in feet
28	Shale, light-grayish-green, somewhat calcareous	1104 - 1132
8	Limestone, very dark-gray, shaly	1132 - 1140
38	Shale, gray to dark-gray, calcareous, containing a <u>little anhydrite</u>	1140 - 1178
41	Shale, grayish-green, calcareous and silty, containing a <u>little anhydrite</u> and occasional fine to medium rounded quartz grains	1178 - 1219
101	Shale, gray and greenish-gray, calcareous	1219 - 1320
14	Shale, gray, calcareous and silty, containing a <u>little anhydrite</u>	1320 - 1334
9	Shale, dark-gray, silty and very calcareous, containing a <u>little anhydrite</u>	1334 - 1343
131	Shale, dark-gray, very calcareous, and in part silty	1343 - 1474
35	Shale, dark-gray, silty and very calcareous, containing a <u>little anhydrite</u>	1474 - 1509
17	Limestone, very fine, dense, light-gray, argillaceous and somewhat magnesian	1509 - 1526
33	Limestone, dark-gray, shaly, containing <u>some anhydrite</u>	1526 - 1559
16	Shale, light-gray to gray, calcareous, containing <u>some anhydrite</u>	1559 - 1575
8	Shale, light-grayish-green, somewhat calcareous	1575 - 1583
15	Limestone, very fine, gray, shaly, containing a <u>little anhydrite</u>	1583 - 1598
10	Limestone, very fine, dense, dark-brownish-gray, argillaceous	1598 - 1608
14	Shale, light-grayish-green, somewhat calcareous, with considerable interbedded dark-brownish-gray shaly limestone	1608 - 1622

Thickness Feet	Description of Strata	Depth in feet
7	Shale, dark-gray, calcareous	1522 - 1629
15	Limestone, very fine, dense, dark-gray, argillaceous and somewhat magnesian, containing <u>some anhydrite</u>	1529 - 1644
36	Limestone, dark-gray, shaly, containing micro-fossils, with considerable interbedded grayish-green, somewhat calcareous shale	1644 - 1680
<u>Bloomsburg red beds, 52 feet</u>		
7	Shale, brick-red, with a little interbedded light-grayish-green, somewhat calcareous shale	1680 - 1687
6	Shale, brick-red, in part silty	1687 - 1693
7	Shale, light-grayish-green, somewhat calcareous, with a little interbedded, very dark-gray, somewhat calcareous shale	1693 - 1700
32	Shale, brick-red	1700 - 1732
<u>Middle Silurian or Niagaran Series, 1108 feet</u>		
<u>McKenzie formation, 382 feet</u>		
14	Limestone, very fine, clastic, dark-gray, argillaceous	1732 - 1746
6	Shale, gray, somewhat calcareous	1746 - 1752
24	Limestone, very fine, clastic, dark-gray, argillaceous, containing micro-fossils, including great numbers of ostracods	1752 - 1776
18	Shale, gray to dark-gray, somewhat calcareous, with considerable interbedded very fine, clastic, dark-gray, argillaceous limestone containing abundant ostracods	1776 - 1794
27	Shale, dark-gray, somewhat calcareous, with a little interbedded very fine, crystalline, light-gray limestone containing abundant fragments of shells including brachiopods	1794 - 1821

Thickness Feet	Description of Strata	Depth in feet
22	Limestone, very fine, clastic, gray to dark-gray, silty, containing ostracods, with some interbedded dark-gray, somewhat calcareous shale	1821 - 1843
27	Shale, dark-gray, somewhat calcareous, with some interbedded very fine, clastic gray to dark-gray, argillaceous limestone containing abundant fragments of shells, including ostracods	1843 - 1870
5	Limestone, very fine, clastic, gray to dark-gray, argillaceous, containing abundant fragments of shells, including ostracods	1870 - 1875
32	Shale, gray, slightly calcareous, with some interbedded very fine, clastic, gray, argillaceous limestone containing abundant fragments of shells, including ostracods	1875 - 1907
8	Shale, gray, slightly calcareous, with considerable interbedded very fine, clastic, light-gray to gray, argillaceous limestone containing abundant fragments of shells and a little very fine-grained, crystalline, mottled, light-gray and red limestone containing a little hematite	1907 - 1915
15	Shale, grayish-green, somewhat calcareous, with considerable interbedded very fine, dense, dark-gray, argillaceous limestone	1915 - 1930
8	Limestone, very fine, dense, brownish- and greenish-gray, argillaceous, containing occasional micro-fossils	1930 - 1938
12	Shale, gray to dark-gray, calcareous	1938 - 1950
10	Limestone, very fine, clastic, gray to dark-gray, argillaceous, containing abundant ostracods throughout and fragments of shells in lower part	1950 - 1960
12	Shale, light-greenish-gray to gray, calcareous	1960 - 1972
43	Shale, dark-gray, somewhat calcareous, with a little interbedded very fine, clastic, dark-gray argillaceous limestone containing fragments of shells	1972 - 2015

Thickness Feet	Description of Strata	Depth in feet
13	Limestone, very fine, dense, dark-gray, argillaceous, with considerable interbedded dark-gray somewhat calcareous shale	2015 - 2028
11	Shale, very dark-gray, calcareous	2028 - 2039
24	Limestone, very fine, clastic, gray to dark-gray, argillaceous, containing abundant micro-fossils with some interbedded, dark-gray, somewhat calcareous shale	2039 - 2063
43	Shale, dark to very dark-gray, somewhat calcareous, with some interbedded, very fine, clastic, gray to dark-gray, argillaceous limestone containing fragments of shells and micro-fossils, including ostracods	2063 - 2106
8	Limestone, very fine, clastic, dark-gray, silty, and argillaceous, containing abundant micro-fossils	2106 - 2114
<u>Clinton group, 726 feet</u>		
<u>Rochester shale, 61 feet</u>		
23	Shale, dark- to very dark-gray, calcareous	2114 - 2137
23	Shale, dark-gray, calcareous, with a little interbedded, very fine, clastic, gray limestone containing micro-fossils	2137 - 2160
15	Limestone, very fine, clastic, gray, containing abundant micro-fossils, with some interbedded dark-gray shale	2160 - 2175
<u>Keefer member, 49 feet</u>		
45	Shale, gray, very slightly calcareous, with a little interbedded, greenish-gray, slightly calcareous siltstone and some fine, clastic, gray limestone containing fragments of shells, including ostracods and occasional oolites	2175 - 2220
4	Sandstone, very fine-grained, gray, calcareous, containing fragments of shells	2220 - 2224

Thickness Feet	Description of Strata	Depth in feet
<u>Rose Hill shale, 585 feet</u>		
38	Shale, grayish-green, with some interbedded, fine, clastic, gray silty limestone containing fragments of shells	2224 - 2262
30	Shale, light-grayish-green	2262 - 2292
23	Shale, light-grayish-green, with some interbedded light-purplish-gray shale	2292 - 2315
20	Shale, purplish-gray, with considerable interbedded grayish-green shale and some grayish-green, slightly calcareous siltstone	2315 - 2335
19	Shale, greenish-gray, with a little interbedded greenish-gray siltstone	2335 - 2354
145	Shale, light-grayish-green	2354 - 2499
8	Shale, greenish- and purplish-gray	2499 - 2507
16	Shale, greenish-gray	2507 - 2523
26	Shale, light-greenish- and purplish-gray	2523 - 2549
5	Shale, purplish-gray	2549 - 2554
5	Shale, greenish- and purplish-gray	2554 - 2559
56	Shale, light-grayish-green with a little interbedded greenish-gray siltstone	2559 - 2615
30	Shale, greenish-gray, with a little interbedded gray, slightly calcareous siltstone containing micro-fossils	2615 - 2645
10	Shale, greenish-gray	2645 - 2655
9	Shale, greenish-gray with a very little interbedded, mottled light-gray and brick-red hematitic limestone	2655 - 2664
32	Shale, greenish-gray	2664 - 2696

Thickness Feet	Description of Strata	Depth in feet
5	Shale, greenish-gray, with a little interbedded gray, slightly calcareous siltstone and a little brick-red, slightly calcareous oolitic hematite	2696 - 2701
72	Shale, greenish-gray, with a little interbedded gray, slightly calcareous siltstone	2701 - 2773
18	Shale, dark- to very dark-gray, with some interbedded, fine-grained, light-greenish- to greenish-gray sandstone	2773 - 2791
6	Sandstone, fine-grained, dark-greenish-gray, argillaceous	2791 - 2797
3	Sandstone, fine-grained, brick-red, hematitic	2797 - 2800
9	Sandstone, fine-grained, greenish-gray, argillaceous	2800 - 2809
<u>Thorold sandstone, 31 feet</u>		
14	Shale, gray, in part silty, with considerable interbedded, very fine- to fine-grained, light-greenish-gray quartzitic and very slightly calcareous sandstone	2809 - 2823
5	Sandstone, very fine- to fine-grained, light-greenish-gray, quartzitic and very slightly calcareous, with a little interbedded gray shale	2823 - 2828
12	Sandstone, very fine- to fine-grained, light-greenish-gray, very slightly calcareous	2828 - 2840
<u>Lower Silurian or Albion Series, 928 feet ?</u>		
<u>Castanea sandstone, 30 feet</u>		
6	Sandstone, very fine-grained, variegated, light-greenish- and reddish-gray, quartzitic, with some interbedded grayish-red silty shale	2840 - 2846
3	Sandstone, very fine-grained, grayish-red, argillaceous and very slightly calcareous, with a little interbedded grayish-green shale	2846 - 2849

Thickness Feet	Description of Strata	Depth in feet
21	Shale, brick-red, silty and sandy, in part very slightly calcareous, with a little interbedded grayish-green shale in lower part	2849 - 2870
	<u>Tuscarora sandstone, 898 feet ?</u>	
5	Sandstone, very fine-grained, light-gray, quartzitic	2870 - 2875
5	Sandstone, very fine-grained, light-gray, quartzitic, with considerable interbedded gray to dark-gray silty and sandy shale	2875 - 2880
21	Sandstone, fine- to medium-grained, light-gray, quartzitic and very slightly calcareous, with a little interbedded gray silty shale	2880 - 2901
19	Sandstone, light-gray, medium-grained, quartzitic and very slightly calcareous, with a little interbedded gray to dark-gray silty shale	2901 - 2920
5	Sandstone, medium-grained, light-gray, quartzose, <u>SALT WATER at 2920, 3 bailers in 2 hours, exhausted slowly</u>	2920 - 2925
8	Sandstone, fine- to medium-grained, light-gray, quartzose	2925 - 2933
11	Sandstone, medium-grained, light-gray, quartzose, <u>SALT WATER at 2938, rose 1500 feet in hole</u>	2933 - 2944
12	Sandstone, fine- to medium-grained, light-gray, almost white, quartzose and slightly calcareous	2944 - 2956
7	Sandstone, medium-grained, light-gray, quartzose	2956 - 2963
69	Sandstone, fine- to medium-grained, light-gray, quartzose, with many of the quartz grains sub-rounded to rounded	2963 - 3032
14	Sandstone, medium- to coarse-grained, light-gray, almost white, quartzose	3032 - 3046

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, very fine- to fine-grained, light-gray, almost white, quartzose, <u>more SALT WATER, rose 2700 feet in hole</u>	3046 - 3051
12	Sandstone, medium-grained, light-gray, almost white, quartzose	3051 - 3063
24	Sandstone, fine- to medium-grained, light-gray, almost white, quartzose	3063 - 3087
9	Sandstone, fine-grained, light-gray, almost white, quartzose	3087 - 3096
44	Sandstone, fine- to medium-grained, light-gray, almost white, quartzose	3096 - 3140
6	Sandstone, medium-grained, light-gray, quartzitic	3140 - 3146
7	Sandstone, very fine- to fine-grained, light-gray to white, quartzitic	3146 - 3153
12	Sandstone, fine- to medium-grained, light-gray, almost white	3153 - 3165
3	Sandstone, fine- to medium-grained, white, quartzitic, with a very little interbedded gray silty and sandy shale	3165 - 3168
45	Sandstone, fine- to medium-grained, white, quartzitic	3168 - 3213
3	Shale, gray to dark-gray, in part silty, with considerable interbedded fine- to medium-grained, white quartzitic sandstone	3213 - 3216
10	Shale, greenish-gray, in part silty, very slightly calcareous	3216 - 3226
8	Shale, greenish-gray, with a little interbedded greenish-gray, slightly calcareous siltstone	3226 - 3234
9	Shale, gray, in part silty	3234 - 3243
3	Shale, greenish-gray	3243 - 3246

Thickness Feet	Description of Strata	Depth in feet
4	Shale, very dark-gray, with considerable interbedded, very fine-grained, light-greenish gray quartzitic sandstone	3246 - 3250
8	Sandstone, very fine- to fine-grained, light-gray, quartzitic, with a little interbedded light- to dark-gray shale	3250 - 3258
12	Shale, dark- to dark-greenish-gray, in part silty, with a little interbedded, very fine-grained, greenish-gray sandstone, occasional fragments show slickensided surfaces	3258 - 3270
14	Sandstone, very fine- to fine-grained, greenish-gray, slightly calcareous, with many quartz grains well rounded	3270 - 3284
7	Sandstone, very fine- to fine-grained, variegated, light-greenish- and reddish-gray, very slightly calcareous	3284 - 3291
7	Sandstone, very fine-grained, greenish-gray	3291 - 3298
3	Sandstone, fine- to medium-grained, pink	3298 - 3301
10	Sandstone, very fine- to fine-grained, greenish-gray, with a little interbedded gray silty shale	3301 - 3311
17	Sandstone, very fine-grained, light-greenish-gray, quartzose	3311 - 3328
23	Sandstone, very fine-grained, light-gray, quartzose	3328 - 3351
5	Sandstone, very fine-grained, variegated, light-gray to reddish-gray	3351 - 3356
13	Sandstone, very fine-grained, light-reddish-gray, quartzose	3356 - 3369
8	Sandstone, very fine-grained, light-gray, quartzose	3369 - 3377
9	Sandstone, very fine-grained, light-gray, quartzitic	3377 - 3386

Thickness Feet	Description of Strata	Depth in feet
4	Sandstone, fine-grained, light-gray, quartzose, with a little interbedded gray silty shale	3386 - 3390
7	Sandstone, fine-grained, light-gray, quartzitic	3390 - 3397
5	Sandstone, fine- to medium-grained, light-gray, quartzitic	3397 - 3402
11	Sandstone, very fine- to fine-grained, quartzose, with a little interbedded gray silty shale	3402 - 3413
3	Sandstone, fine- to medium-grained, light-gray, quartzose	3413 - 3416
6	Sandstone, very fine- to fine-grained, light-gray, quartzose	3416 - 3422
11	Sandstone, fine- to medium-grained, light-gray, quartzitic	3422 - 3433
11	Sandstone, fine-grained, light-gray, almost white, quartzose	3433 - 3444
3	Sandstone, fine-grained, light-gray, quartzitic, with some interbedded gray silty shale	3444 - 3447
37	Sandstone, fine- to medium-grained, light-gray, almost white, quartzitic	3447 - 3484
11	Sandstone, very fine- to fine-grained, light-gray, quartzose	3484 - 3495
7	Sandstone, fine- to medium-grained, light-gray, quartzitic	3495 - 3502
8	Sandstone, fine- to medium-grained, light-gray, quartzose	3502 - 3510
13	Sandstone, fine-grained, light-gray, quartzose	3510 - 3523
6	Sandstone, fine- to medium-grained, light-gray, quartzitic	3523 - 3529

Thickness Feet	Description of Strata	Depth in feet
8	Sandstone, fine-grained, light-gray, quartzose	3529 - 3537
5	Sandstone, very fine- to fine-grained, light-gray, quartzitic	3537 - 3542
12	Sandstone, fine- to medium-grained, light-gray, almost white, quartzose	3542 - 3554
17	Sandstone, fine- to medium-grained, light-gray, quartzitic	3554 - 3571
11	Sandstone, fine-grained, light-gray, quartzitic	3571 - 3582
5	Sandstone, fine- to medium-grained, light-gray, quartzitic	3582 - 3587
6	Sandstone, very fine- to fine-grained, light-gray, quartzitic	3587 - 3593
31	Sandstone, fine- to medium-grained, light-gray, quartzitic	3593 - 3624
8	Sandstone, medium-grained, very light-reddish-gray, quartzitic	3624 - 3632
4	Sandstone, fine-grained, light-gray, quartzitic	3632 - 3636
6	Sandstone, fine-grained, light-gray, quartzitic, with some interbedded grayish-red silty shale and siltstone	3636 - 3642
5	Sandstone, fine-grained, grayish-red, quartzitic	3642 - 3647
3	Sandstone, medium-grained, light-gray, quartzitic, with a little interbedded grayish-red silty shale	3647 - 3650
6	Shale, brick-red, silty, with some interbedded, coarse-grained, grayish-red, argillaceous sandstone	3650 - 3656

Thickness Feet	Description of Strata	Depth in feet
7	Sandstone, medium-grained, light-reddish-gray, quartzitic, with some interbedded grayish-red silty shale	3656 - 3663
12	Sandstone, medium-grained, very light-reddish-gray, quartzitic	3663 - 3675
7	Sandstone, medium-grained, light-gray, quartzitic, with a little interbedded grayish-red silty shale	3675 - 3682
2	Sandstone, fine-grained, light-gray, quartzitic	3682 - 3684
3	Sandstone, fine-grained, light-reddish-gray, quartzitic	3684 - 3687
2	Sandstone, medium-grained, light-reddish-gray, quartzitic	3687 - 3689
4	Sandstone, fine- to medium-grained, light-gray, quartzitic, with a little interbedded grayish-red silty shale	3689 - 3693
12	Sandstone, fine-grained, light-reddish-gray, quartzitic	3693 - 3705
2	Sandstone, medium-grained, light-gray, quartzitic, with a little interbedded grayish-red silty shale	3705 - 3707
9	Sandstone, fine- to medium-grained, light reddish-gray, quartzitic	3707 - 3716
9	Sandstone, fine-grained, light-reddish-gray, quartzitic	3716 - 3725
4	Sandstone, fine-grained, light-gray, quartzitic, with a little interbedded grayish-red silty shale	3725 - 3729
24	Sandstone, fine-grained, light-reddish-gray, quartzitic	3729 - 3753
3	Sandstone, fine-grained, light-gray quartzitic	3753 - 3756

Thickness Feet	Description of Strata	Depth in feet
5	Sandstone, fine-grained, light-gray, quartzitic, with a little interbedded grayish-red silty shale	3756 - 3761
6	Sandstone, very fine- to fine-grained, light-gray, quartzitic	3761 - 3767
1	Sandstone, fine- to medium-grained, light-reddish gray, quartzitic	3767 - 3768

ORDOVICIAN SYSTEM, 5211+ feet

Upper Ordovician or Cincinnati Series, 3772 feet ?

Juniata formation, 1998 feet ?

7	Sandstone, fine- to medium-grained, grayish-red, argillaceous, with some interbedded grayish-red silty shale	3768 - 3775
15	Shale, grayish-red, silty, with considerable interbedded fine- to medium-grained reddish-gray sandstone	3775 - 3790
11	Shale, grayish-red, in part silty	3790 - 3801
11	Sandstone, very fine-grained, grayish-red, argillaceous	3801 - 3812
102	Shale, brick-red, silty and sandy	3812 - 3914
5	Sandstone, brick-red, very fine-grained, argillaceous	3914 - 3919
229	Shale, brick-red, silty and sandy	3919 - 4148
24	Sandstone, very fine-grained, grayish-red, argillaceous, with some interbedded brick-red shale	4148 - 4172
26	Shale, brick-red, silty and sandy	4172 - 4198
7	Sandstone, very fine-grained, light-grayish-green, with some interbedded grayish-green silty shale	4198 - 4205

Thickness Feet	Description of Strata	Depth in feet
9	Shale, brick-red, in part silty, with some interbedded light-grayish-green siltstone	4205 - 4214
9	Sandstone, very fine-grained, grayish-red, argillaceous	4214 - 4223
28	Shale, brick-red, silty and sandy	4223 - 4251
7	Sandstone, very fine-grained, reddish-brown, very slightly calcareous	4251 - 4258
9	Shale, brick-red	4258 - 4267
5	Shale, grayish-red, sandy, with some interbedded brick-red shale	4267 - 4272
5	Sandstone, very fine-grained, grayish-red, argillaceous, with a little interbedded brick-red shale	4272 - 4277
16	Shale, brick-red, with some interbedded, very fine-grained, grayish-red argillaceous sandstone	4277 - 4293
17	Shale, brick-red, in part silty and sandy	4293 - 4310
10	Siltstone, grayish-green, with considerable interbedded brick-red silty shale	4310 - 4320
30	Shale, brick-red, silty and sandy	4320 - 4350
5	Shale, grayish-green, with a little interbedded very fine-grained, light-greenish-gray sandstone	4350 - 4355
12	Sandstone, very fine-grained, brick-red, argillaceous, with some interbedded brick-red shale	4355 - 4367
12	Siltstone, brick-red, very slightly calcareous, with a little interbedded brick-red shale	4367 - 4379
8	Shale, brick-red, sandy	4379 - 4387

Thickness Feet	Description of Strata	Depth in feet
4	Sandstone, very fine-grained, brick-red, argillaceous, containing a few fragments showing slickensided surfaces along which chlorite has developed	4387 - 4391
9	Shale, brownish-red, sandy, with some interbedded greenish-gray siltstone and a little shale in lower part	4391 - 4400
12	Sandstone, very fine-grained, grayish-green, with a little interbedded very fine-grained, grayish-red, argillaceous sandstone	4400 - 4412
5	Sandstone, very fine-grained, grayish-red, argillaceous, with a little interbedded fine-grained, grayish-green sandstone	4412 - 4417
16	Shale, brick-red, silty	4417 - 4433
17	Sandstone, very fine-grained, grayish-red, argillaceous	4433 - 4450
18	Shale, brick-red, in part silty	4450 - 4468
4	Sandstone, very fine-grained, light-greenish-gray	4468 - 4472
14	Shale, brick-red, silty	4472 - 4486
5	Sandstone, very fine-grained, grayish-red, argillaceous	4486 - 4491
9	Shale, grayish-green, with considerable interbedded grayish-green siltstone	4491 - 4500
12	Sandstone, very fine-grained, grayish-red, argillaceous, with some interbedded brick-red and greenish-gray shale	4500 - 4512
33	Shale, brick-red, silty	4512 - 4545
21	Sandstone, very fine-grained, grayish-red, argillaceous, with a little interbedded brick-red shale	4545 - 4566
12	Shale, brick-red, in part silty	4566 - 4578

Thickness Feet	Description of Strata	Depth in feet
4	Siltstone, greenish-gray	4578 - 4582
14	Sandstone, very fine-grained, light-greenish- to greenish-gray	4582 - 4596
5	Sandstone, very fine-grained, grayish-red, argillaceous, with some interbedded grayish-green siltstone	4596 - 4601
6	Shale, brick-red, silty	4601 - 4607
18	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous, with considerable interbedded brick-red silty shale in middle part	4607 - 4625
3	Siltstone, greenish-gray	4625 - 4628
14	Sandstone, very fine-grained, variegated, greenish- and reddish-gray, argillaceous	4628 - 4642
26	Sandstone, very fine-grained, grayish-red, argillaceous	4642 - 4668
6	Sandstone, very fine-grained, grayish-red, argillaceous, with a little interbedded very fine-grained, greenish-gray argillaceous sandstone	4668 - 4674
9	Shale, brick-red, silty and sandy	4674 - 4683
8	Sandstone, very fine-grained, grayish-red, argillaceous	4683 - 4691
11	Shale, brick-red, sandy	4691 - 4702
20	Siltstone, grayish-red	4702 - 4722
7	Shale, brick-red, silty	4722 - 4729
16	Sandstone, very fine-grained, grayish-red, argillaceous	4729 - 4745
5	Shale, brick-red, silty and sandy	4745 - 4750
10	Sandstone, very fine-grained, grayish-red, argillaceous	4750 - 4760

Thickness Feet	Description of Strata	Depth in feet
15	Sandstone, very fine-grained, grayish-red, argillaceous, with some interbedded grayish-green silty shale	4760 - 4775
30	Sandstone, very fine-grained, grayish-red, with a little interbedded grayish-red silty shale	4775 - 4805
15	Shale, grayish-red, silty, with some interbedded, very fine-grained, grayish-red argillaceous sandstone	4805 - 4820
28	Sandstone, very fine-grained, grayish-red, argillaceous, with a little interbedded grayish-red silty shale	4820 - 4848
16	Shale, grayish-red, silty, with a little interbedded very fine-grained, grayish-red argillaceous sandstone	4848 - 4864
4	Sandstone, very fine-grained, grayish-red, argillaceous	4864 - 4868
4	Sandstone, very fine-grained, greenish-gray	4868 - 4872
5	Sandstone, very fine-grained, grayish-red, argillaceous, with a little interbedded grayish-green shale	4872 - 4877
10	Sandstone, very fine-grained, light-gray	4877 - 4887
12	Shale, grayish-red, silty and sandy	4887 - 4899
8	Sandstone, very fine- to fine-grained, greenish-gray, with a little interbedded grayish-red shale	4899 - 4907
18	Sandstone, very fine-grained, grayish-red, with some interbedded grayish-green silty shale in lower part	4907 - 4925
6	Sandstone, very fine-grained, greenish- and reddish-gray	4925 - 4931
6	Sandstone, very fine- to fine-grained, grayish-red	4931 - 4937

Thickness Feet	Description of Strata	Depth in feet
10	Sandstone, very fine-grained, light-gray to greenish-gray, with considerable interbedded, very fine-grained, reddish-gray sandstone	4937 - 4947
10	Sandstone, very fine-grained, dark-grayish-red, argillaceous, with a little interbedded grayish-green silty shale	4947 - 4957
3	Shale, brick-red, silty	4957 - 4960
3	Siltstone, grayish-green	4960 - 4963
7	Sandstone, very fine-grained, grayish-red, argillaceous, with a little interbedded grayish-green silty shale	4963 - 4970
2	Siltstone, grayish-red	4970 - 4972
6	Shale, brick-red, silty	4972 - 4978
3	Shale, grayish-green	4978 - 4981
7	Shale, brick-red, in part silty	4981 - 4988
54	Sandstone, very fine- to fine-grained, grayish-red, argillaceous	4988 - 5042
13	Sandstone, very fine-grained, greenish-gray, with some interbedded grayish-green shale	5042 - 5055
13	Sandstone, very fine- to fine-grained, greenish- and reddish-gray, argillaceous	5055 - 5068
3	Shale, brick-red, silty	5068 - 5071
3	Sandstone, very fine-grained, grayish-red, argillaceous	5071 - 5074
5	Shale, grayish-green, with some interbedded very fine-grained, greenish-gray, argillaceous sandstone	5074 - 5079
3	Sandstone, very fine-grained, grayish-red, argillaceous	5079 - 5082

Thickness Feet	Description of Strata	Depth in feet
12	Siltstone, brick-red, with considerable interbedded, very fine-grained, greenish-gray sandstone in lower part	5082 - 5094
4	Sandstone, very fine- to fine-grained, greenish-gray, with some interbedded grayish-green shale	5094 - 5098
14	Sandstone, very fine- to fine-grained, light-greenish-gray	5098 - 5112
3	Sandstone, very fine- to fine-grained, light-gray, quartzitic	5112 - 5115
5	Shale, brick-red	5115 - 5120
22	Sandstone, very fine-grained, reddish-gray	5120 - 5142
6	Sandstone, very fine-grained, reddish-gray, with a little interbedded greenish-gray shale	5142 - 5148
22	Sandstone, very fine-grained, reddish-gray, argillaceous	5148 - 5170
5	Shale, brick-red, in part silty	5170 - 5175
8	Sandstone, very fine-grained, grayish-red, argillaceous	5175 - 5183
12	Shale, brick-red, silty and sandy	5183 - 5195
5	Sandstone, very fine-grained, dark-reddish-gray, argillaceous	5195 - 5200
21	Shale, grayish-red, silty and sandy	5200 - 5221
77	Sandstone, very fine-grained, grayish-red, argillaceous	5221 - 5298
11	Shale, grayish-red, sandy	5298 - 5309
18	Sandstone, very fine-grained, grayish-red, argillaceous	5309 - 5327
5	Sandstone, fine-grained, grayish-red	5327 - 5332

Thickness Feet	Description of Strata	Depth in feet
2	Sandstone, very fine-grained, grayish-red, with a little interbedded brick-red shale	5332 - 5334
35	Sandstone, very fine-grained, grayish-red	5334 - 5369
16	Sandstone, very fine- to fine-grained, grayish-red, argillaceous	5369 - 5385
5	Sandstone, very fine-grained, dark-grayish-red, argillaceous	5385 - 5390
31	Sandstone, very fine-grained, grayish-red, argillaceous	5390 - 5421
1	Shale, dark-reddish-brown, silty, with a little interbedded grayish-green shale	5421 - 5422
4	Sandstone, very fine-grained, reddish-gray	5422 - 5426
10	Shale, brick-red, silty, with considerable interbedded greenish-gray silty shale in upper part	5426 - 5436
2	Shale, brick-red, sandy	5436 - 5438
12	Sandstone, very fine-grained, grayish-red, argillaceous	5438 - 5450
2	Siltstone, reddish-brown, with considerable interbedded grayish-green shale	5450 - 5452
36	Sandstone, very fine-grained, grayish-red, in part argillaceous	5452 - 5488
2	Sandstone, very fine-grained, gray	5488 - 5490
9	Sandstone, very fine-grained, brownish-gray, argillaceous	5490 - 5499
1	Shale, brick-red, silty, with a little interbedded greenish-gray siltstone	5499 - 5500
3	Sandstone, very fine-grained, light-greenish-to greenish-gray, argillaceous	5500 - 5503
5	Sandstone, very fine-grained, greenish- and reddish-gray, argillaceous	5503 - 5508

Thickness Feet	Description of Strata	Depth in feet
4	Sandstone, very fine-grained, reddish-gray	5508 - 5512
4	Shale, brick-red, in part silty	5512 - 5516
8	Sandstone, very fine-grained, reddish-brown, with considerable interbedded dark-greenish-gray sandy shale in lower part	5516 - 5524
13	Sandstone, very fine- to fine-grained, greenish-gray	5524 - 5537
4	Sandstone, fine-grained, dark-reddish-gray, hard	5537 - 5541
2	Sandstone, very fine-grained, dark-reddish-gray, argillaceous, hard, intersected by minute quartz veinlets	5541 - 5543
5	Sandstone, very fine-grained, dark-brownish-gray	5543 - 5548
1	Siltstone, greenish-gray	5548 - 5549
3	Sandstone, very fine- to fine-grained, dark-reddish-brown, argillaceous	5549 - 5552
4	Shale, brick-red, exhibiting some slicken-sided surfaces and intersected by minute quartz and chlorite veinlets, with considerable interbedded greenish-gray siltstone in lower part	5552 - 5556
3	Sandstone, very fine-grained, greenish-gray, with considerable interbedded greenish-gray silty shale in lower part	5556 - 5559
7	Sandstone, very fine-grained, variegated, greenish-gray and dark-reddish-brown	5559 - 5566
5	Sandstone, very fine-grained, reddish-brown, argillaceous, hard	5566 - 5571
2	Shale, brick-red, silty	5571 - 5573
5	Sandstone, very fine-grained, grayish-red, argillaceous, hard	5573 - 5578

Thickness Feet	Description of Strata	Depth in feet
6	Shale, greenish-gray, silty, with considerable interbedded, very fine-grained, greenish-gray argillaceous sandstone	5578 - 5584
3	Sandstone, very fine-grained, greenish-gray, with some interbedded grayish-red shale	5584 - 5587
4	Sandstone, very fine-grained, grayish-red, hard	5587 - 5591
2	Shale, greenish-gray, with some interbedded greenish-gray siltstone	5591 - 5593
4	Sandstone, very fine-grained, grayish-red, argillaceous	5593 - 5597
12	Shale, brick-red, silty and sandy	5597 - 5609
4	Sandstone, very fine-grained, greenish-gray, argillaceous, with some interbedded grayish-green shale	5609 - 5613
6	Sandstone, very fine-grained, grayish-red, with a little interbedded grayish-green shale	5613 - 5619
5	Sandstone, very fine-grained, variegated, grayish-red and green, argillaceous, with a little interbedded grayish-green shale	5619 - 5624
3	Sandstone, very fine-grained, grayish-red, argillaceous	5624 - 5627
2	Shale, brick-red, sandy	5627 - 5629
9	Sandstone, very fine-grained, grayish-red, argillaceous	5629 - 5638
6	Sandstone, very fine-grained, greenish-gray, with considerable interbedded grayish-green shale	5638 - 5644
3	Sandstone, very fine-grained, variegated, greenish- and reddish-gray, argillaceous	5644 - 5647
3	Sandstone, very fine-grained, reddish-gray, argillaceous	5647 - 5650

Thickness Feet	Description of Strata	Depth in feet
4	Sandstone, very fine- to fine-grained, variegated, greenish- and reddish-gray	5650 - 5654
20	Sandstone, very fine-grained, grayish-red	5654 - 5674
12	Shale, brick-red, silty and sandy	5674 - 5686
4	Sandstone, very fine-grained, variegated, greenish- and reddish-gray, argillaceous, with some interbedded grayish-green shale	5686 - 5690
8	Shale, brick-red	5690 - 5698
3	Shale, brick-red, silty and sandy	5698 - 5701
8	Sandstone, very fine-grained, grayish-red, argillaceous, with some interbedded grayish-green shale in lower part	5701 - 5709
11	Shale, brick-red, in part silty	5709 - 5720
10	Shale, brick-red, silty, with some interbedded greenish-gray siltstone	5720 - 5730
2	Shale, grayish-red, sandy	5730 - 5732
1	Sandstone, very fine-grained, grayish-red, argillaceous	5732 - 5733
2	Sandstone, very fine-grained, grayish-green, argillaceous	5733 - 5735
13	Shale, brick-red, in part silty	5735 - 5748
10	Sandstone, very fine-grained, grayish-green, argillaceous, with some interbedded grayish-green shale and a little brick-red shale	5748 - 5758
3	Sandstone, very fine-grained, greenish-gray	5758 - 5761
3	Shale, brick-red, with some interbedded greenish-gray siltstone	5761 - 5764
2	Sandstone, very fine-grained, greenish-gray, with some interbedded brick-red shale	5764 - 5766

Thickness Feet	Description of Strata	Depth in feet
<u>Oswego sandstone, 154 feet</u>		
8	Sandstone, very fine-grained, greenish-gray	5766 - 5774
5	Sandstone, very fine-grained, greenish-gray, with some interbedded greenish-gray silty shale	5774 - 5779
13	Siltstone, greenish-gray, with some interbedded greenish-gray shale	5779 - 5792
17	Sandstone, very fine-grained, greenish-gray, with some interbedded greenish-gray silty shale	5792 - 5809
4	Siltstone, greenish-gray	5809 - 5813
8	Sandstone, very fine-grained, light-greenish-gray, hard, with a little interbedded greenish-gray shale in lower part	5813 - 5821
2	Shale, brick-red	5821 - 5823
17	Shale, greenish-gray, in part silty, with some interbedded gray shale	5823 - 5840
16	Siltstone, greenish-gray, with some interbedded greenish-gray shale and a little brick-red shale	5840 - 5856
13	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded greenish-gray shale	5856 - 5869
6	Sandstone, very fine- to fine-grained, light-greenish-gray, slightly calcareous	5869 - 5875
1	Shale, greenish-gray	5875 - 5876
5	Sandstone, very fine-grained, greenish-gray	5876 - 5881
14	Sandstone, very fine-grained, light-greenish-gray, hard	5881 - 5895

Thickness Feet	Description of Strata	Depth in feet
17	Sandstone, very fine-grained, greenish-gray, argillaceous, with a little interbedded greenish-gray silty shale	5895 - 5912
8	Siltstone, greenish-gray, with some interbedded greenish-gray shale	5912 - 5920
	<u>Reedsville shale, 1620 feet ?</u>	
13	Shale, dark-gray, with some interbedded greenish-gray siltstone	5920 - 5933
10	Shale, very dark-gray, almost black, silty and sandy, with a little interbedded greenish-gray silty shale	5933 - 5943
3	Shale, dark-gray, silty, with a little interbedded, very fine-grained, greenish-gray sandstone in lower part	5943 - 5946
6	Shale, dark-gray, in part silty, with a little interbedded very fine-grained, light-gray, somewhat calcareous sandstone	5946 - 5952
5	Shale, dark-gray, with a little interbedded greenish-gray siltstone	5952 - 5957
5	Shale, dark-gray, with some interbedded very fine-grained, light-gray, somewhat calcareous sandstone in upper part and some greenish-gray, slightly calcareous siltstone in lower part	5957 - 5962
1	Shale, dark-gray, with some interbedded greenish-gray siltstone containing abundant fragments of shells, mostly brachiopods	5962 - 5963
1	Siltstone, greenish-gray, calcareous	5963 - 5964
6	Shale, dark-gray, with a little interbedded greenish-gray, somewhat calcareous siltstone	5964 - 5970
5	Shale, very dark-gray, silty, with a little interbedded greenish-gray, somewhat calcareous siltstone	5970 - 5975

Thickness Feet	Description of Strata	Depth in feet
7	Shale, dark- to very dark-gray, silty and sandy	5975 - 5982
11	Shale, dark-gray, with a little interbedded very fine-grained, light-gray, somewhat calcareous sandstone	5982 - 5993
7	Sandstone, very fine- to fine-grained, light-gray to gray, somewhat calcareous, with considerable interbedded dark-gray shale	5993 - 6000
12	Shale, dark-gray, with a little interbedded gray, slightly calcareous siltstone	6000 - 6012
7	Sandstone, very fine-grained, light-gray to gray, calcareous, with an occasional brachiopod shell in upper part, with considerable interbedded dark-gray shale	6012 - 6019
6	Shale, gray to dark-gray	6019 - 6025
7	Sandstone, very fine-grained, light-gray to gray, calcareous, with considerable interbedded gray to dark-gray shale	6025 - 6032
14	Shale, gray to dark-gray, with a little interbedded gray, slightly calcareous siltstone	6032 - 6046
11	Shale, gray to dark-gray, with a little interbedded, very fine-grained, light-greenish-gray, somewhat calcareous sandstone	6046 - 6057
8	Shale, gray to dark-gray, with a little interbedded greenish-gray, somewhat calcareous siltstone containing occasional fragments of shells	6057 - 6065
9	Shale, dark-gray, with a little interbedded, very fine-grained, light-gray, calcareous sandstone containing fragments of shells	6065 - 6074
17	Shale, dark-gray, with a little interbedded gray, somewhat calcareous siltstone	6074 - 6091

Thickness Feet	Description of Strata	Depth in feet
2	Shale, dark-gray, with some interbedded, very fine-grained, light-gray to gray, calcareous sandstone containing abundant fragments of shells	6091 - 6093
67	Shale, dark-gray, with some interbedded gray, calcareous siltstone containing fragments of shells	6093 - 6160
3	Sandstone, very fine-grained, light-gray, somewhat calcareous, with considerable interbedded dark-gray shale	6160 - 6163
7	Shale, dark-gray, with a little interbedded gray, somewhat calcareous siltstone	6163 - 6170
36	Shale, dark-gray, with some interbedded, very fine-grained, light-gray, somewhat calcareous sandstone containing fragments of shells	6170 - 6206
84	Shale, dark-gray, with some interbedded, gray, somewhat calcareous siltstone containing fragments of shells	6206 - 6290
35	Shale, gray to dark-gray, with some interbedded, gray, somewhat calcareous siltstone containing fragments of shells	6290 - 6325
96	Shale, dark-gray, with some interbedded, gray, somewhat calcareous siltstone containing fragments of shells	6325 - 6421
20	Shale, gray to dark-gray, with some interbedded, gray, somewhat calcareous siltstone containing fragments of shells	6421 - 6441
43	Shale, dark-gray, with some interbedded gray, somewhat calcareous siltstone containing fragments of shells	6441 - 6484
24	Shale, gray to dark-gray, with a little interbedded, gray, somewhat calcareous siltstone containing fragments of shells	6484 - 6508

Thickness Feet	Description of Strata	Depth in feet
11	Shale, gray to dark-gray, slightly calcareous, with a little interbedded gray, somewhat calcareous siltstone containing fragments of shells	6508 - 6519
3	Sandstone, very fine-grained, light-gray to gray, calcareous, containing fragments of shells	6519 - 6522
49	Shale, gray to dark-gray, slightly calcareous, with some interbedded gray, somewhat calcareous siltstone containing fragments of shells	6522 - 6571
95	Shale, dark-gray, slightly calcareous, with some interbedded gray, somewhat calcareous siltstone containing fragments of shells	6571 - 6666
42	Shale, dark-gray, slightly calcareous, with a little interbedded gray, somewhat calcareous siltstone containing occasional shell fragments	6666 - 6708
45	Shale, gray to dark-gray, with a little interbedded gray, slightly calcareous siltstone containing occasional shell fragments	6708 - 6753
79	Shale, dark-gray, with a little interbedded gray, slightly calcareous siltstone	6753 - 6832
34	Shale, dark-gray, with a little interbedded brownish-gray, slightly calcareous siltstone	6832 - 6866
46	Shale, dark- to very dark-gray, with a little interbedded dark-brownish-gray, slightly calcareous siltstone, <u>very small GAS POCKETS at 6866, 6872, and 6898</u>	6866 - 6912
20	Shale, dark-gray, intersected by occasional calcite veinlets, with a little interbedded brownish-gray, slightly calcareous siltstone	6912 - 6932
13	Shale, dark- to very dark-gray, intersected by occasional calcite veinlets, with a little interbedded brownish-gray siltstone	6932 - 6945

Thickness Feet	Description of Strata	Depth in feet
59	Shale, dark- to very dark-gray, with a little interbedded brownish-gray, slightly calcareous siltstone	6945 - 7004
18	Shale, very dark-gray, intersected by occasional calcite veinlets, with a little interbedded dark-brownish-gray, slightly calcareous siltstone	7004 - 7022
36	Shale, very dark-gray, with a little interbedded dark-gray, slightly calcareous siltstone	7022 - 7058
89	Shale, very dark-gray, in part brecciated and slickensided and intersected by calcite veinlets, with a little interbedded dark-gray somewhat calcareous siltstone containing occasional fragments of shells	7058 - 7147
5	Shale, very dark-gray, in part silty, intersected by occasional calcite veinlets, with a little interbedded dark-gray, slightly calcareous siltstone	7147 - 7152
31	Shale, very dark-gray to grayish-black, with a little interbedded gray to dark-gray, slightly calcareous siltstone	7152 - 7183
34	Shale, very dark-gray, with a little interbedded dark-gray, slightly calcareous siltstone	7183 - 7217
12	Shale, very dark-gray, very slightly calcareous, intersected by occasional calcite veinlets, with a little interbedded dark-gray, somewhat calcareous siltstone	7217 - 7229
3	Shale, very dark-gray to grayish-black, very slightly calcareous, with a little interbedded dark-gray, somewhat calcareous siltstone	7229 - 7232
17	Shale, very dark-gray, intersected by occasional calcite veinlets, with a little interbedded dark-gray, somewhat calcareous siltstone	7232 - 7249

Thickness Feet	Description of Strata	Depth in feet
20	Shale, dark- to very dark-gray, containing an occasional shell fragment and intersected by some minute calcite veinlets	7249 - 7269
31	Shale, dark- to very dark-gray, somewhat calcareous and in part silty, intersected by occasional minute calcite veinlets	7269 - 7300
45	Shale, dark- to very dark-gray, somewhat calcareous, intersected by numerous calcite veinlets	7300 - 7345
8	Shale, dark- to very dark-gray, slightly calcareous, with a little interbedded gray, calcareous siltstone	7345 - 7353
22	Shale, dark- to very dark-gray, slightly calcareous, exhibiting slickensided surfaces and intersected by numerous calcite veinlets	7353 - 7375
71	Shale, very dark-gray, slightly calcareous, exhibiting occasional slickensided surfaces and intersected by numerous calcite veinlets	7375 - 7446
18	Shale, dark-gray, slightly calcareous, intersected by calcite veinlets	7446 - 7464
22	Shale, dark- to very dark-gray, slightly calcareous	7464 - 7486
54	Shale, very dark-gray, slightly calcareous	7486 - 7540
<u>Middle Ordovician or Champlainian Series, 1297 feet</u>		
<u>Antes shale, 267 feet</u>		
33	Shale, very dark-gray to grayish-black, slightly calcareous and in part silty	7540 - 7573
49	Shale, very dark-gray, slightly calcareous, intersected by occasional calcite veinlets	7573 - 7622
15	Shale, very dark-gray, somewhat calcareous	7622 - 7637
21	Shale, very dark-gray to grayish-black, somewhat calcareous	7637 - 7658

Thickness Feet	Description of Strata	Depth in feet
26	Shale, dark- to very dark-gray, slightly calcareous	7658 - 7684
8	Shale, very dark-gray, slightly calcareous, containing minutely disseminated pyrite	7684 - 7692
6	Shale, very dark-gray, slightly calcareous, containing minutely disseminated pyrite and a thin seam of gray <u>bentonite</u> with hexagonal mica flakes	7692 - 7698
13	Shale, very dark-gray, slightly calcareous, containing minutely disseminated pyrite	7698 - 7711
4	Shale, grayish-black, slightly calcareous, with a little interbedded very dark-gray, argillaceous limestone containing micro-fossils	7711 - 7715
23	Shale, very dark-gray to grayish-black, somewhat calcareous, containing minutely disseminated pyrite and intersected by some calcite veinlets	7715 - 7738
62	Shale, grayish-black, calcareous, intersected by occasional calcite veinlets	7738 - 7800
7	Shale, very dark-gray, calcareous	7800 - 7807
<u>Trenton limestone, 461 feet</u>		
8	Limestone, very fine, dense, dark-to very dark-gray, argillaceous, with considerable interbedded very dark-gray, calcareous shale	7807 - 7815
11	Limestone, very fine, dense, dark-gray, argillaceous, containing occasional fragments of shells, with some interbedded, very dark-gray to grayish-black calcareous shale	7815 - 7826
14	Limestone, dark- to very dark-gray, shaly, containing fragments of shells, and intersected by some white calcite veinlets, with some interbedded, very dark-gray to grayish-black calcareous shale	7826 - 7840

Thickness Feet	Description of Strata	Depth in feet
34	Limestone, dark-gray, shaly, containing occasional fragments of small shells	7840 - 7874
8	Limestone, dark-gray, shaly, with a little interbedded fine, clastic, light-gray limestone containing fragments of shells	7874 - 7882
18	Shale, very dark-gray, very calcareous, with some interbedded dark-gray, silty and argillaceous limestone	7882 - 7900
13	Shale, dark-gray, calcareous	7900 - 7913
22	Limestone, very dark-gray, shaly, with some interbedded dark-gray, silty and argillaceous limestone containing an occasional brachiopod shell fragment	7913 - 7935
17	Limestone, very dark-gray, shaly, intersected by numerous white calcite veinlets	7935 - 7952
23	Limestone, very fine, clastic, gray, argillaceous, intersected by white calcite veinlets, with some interbedded, very dark-gray to grayish-black, calcareous shale	7952 - 7975
13	Limestone, very dark-gray, shaly, containing occasional fragments of shells, mostly brachiopods, intersected by white calcite veinlets	7975 - 7988
12	Limestone, very fine, dense, gray to dark-gray, argillaceous, containing occasional shell fragments, with considerable interbedded, very dark-gray, calcareous shale	7988 - 8000
40	Limestone, very fine, dense, gray, argillaceous, containing occasional shell fragments, with some interbedded, very dark-gray to grayish-black, calcareous shale particles	8000 - 8040
31	Limestone, very fine, clastic, gray to dark-gray, argillaceous, containing occasional fragments of shells	8040 - 8071

Thickness Feet	Description of Strata	Depth in feet
22	Limestone, dark- to very dark-gray, shaly, with considerable interbedded gray to dark-gray, silty and argillaceous limestone containing occasional shell fragments	8071 - 8093
29	Limestone, very fine, clastic, gray to dark-gray, argillaceous, containing occasional fragments of shells, including crinoid stems, with some interbedded very dark-gray, calcareous shale	8093 - 8122
48	Limestone, very fine, clastic, gray to dark-gray, argillaceous, containing occasional fragments of shells, with some interbedded grayish-black, calcareous shale	8122 - 8170
48	Limestone, very fine, clastic, gray to dark-gray, argillaceous, intersected by some white calcite veinlets, with considerable interbedded very dark-gray to grayish-black, calcareous shale	8170 - 8218
12	Limestone, very fine, clastic, dark-gray, argillaceous, with a little interbedded light-gray bentonite	8218 - 8230
8	Limestone, very fine, dense, very dark-gray, argillaceous	8230 - 8238
10	Limestone, very fine, clastic, dark-gray, argillaceous, containing occasional fragments of shells, with some interbedded very light-gray, almost white bentonite	8238 - 8248
20	Limestone, gray to dark-gray, argillaceous and in part shaly, containing an occasional shell fragment, with some interbedded very dark-gray to grayish-black, somewhat calcareous shale	8248 - 8268
<u>Black River group, 482 feet</u>		
28	Limestone, sublithographic, very dark-brownish-gray, somewhat argillaceous, with a little interbedded very dark-gray, shaly limestone and a little light-gray bentonite	8268 - 8296

Thickness Feet	Description of Strata	Depth in feet
17	Limestone, very fine, clastic, gray to very dark-gray, somewhat argillaceous, <u>with a little interbedded light-gray bentonite</u>	8296 - 8313
46	Limestone, very fine, clastic, dark-gray, somewhat argillaceous, containing an occasional shell fragment, intersected by white calcite veinlets	8313 - 8359
14	Limestone, sublithographic to fine-crystalline, mottled light- to dark-brownish-gray, somewhat argillaceous	8359 - 8363
10	Limestone, sublithographic to fine-crystalline, mottled light- to dark-brownish-gray	8363 - 8373
9	Limestone, sublithographic to fine-crystalline, mottled light- to dark-brownish-gray, somewhat argillaceous	8373 - 8382
25	Limestone, sublithographic to very fine, clastic, dark- to very dark-gray, somewhat argillaceous	8382 - 8407
13	Limestone, very fine, clastic, dark-gray, argillaceous, containing an occasional fragment of brachiopod shell	8407 - 8420
56	Limestone, sublithographic, dark- to very dark-brownish-gray	8420 - 8476
22	Limestone, sublithographic, dark- to very dark-brownish-gray, somewhat argillaceous	8476 - 8498
48	Limestone, sublithographic, dark-brownish-gray	8498 - 8546
54	Limestone, sublithographic, dark-brownish-gray, somewhat argillaceous	8546 - 8600
7	Limestone, sublithographic, light-brownish-gray, somewhat magnesian	8600 - 8607
16	Limestone, medium-grained, clastic, brownish- to dark-brownish-gray, containing fragments of shells	8607 - 8623

Thickness Feet	Description of Strata	Depth in feet
21	Limestone, very fine, clastic, gray, argillaceous	8623 - 8644
29	Limestone, fine to medium, clastic, dark- to very dark-brownish-gray, argillaceous and somewhat magnesian	8644 - 8673
12	Limestone, sublithographic, very dark-brownish-gray, somewhat argillaceous	8673 - 8685
23	Limestone, sublithographic, dark-brownish-gray, containing a few very minute doubly terminated quartz crystals, intersected by occasional white calcite veinlets	8685 - 8708
19	Limestone, very fine, clastic, very dark-brownish-gray, somewhat argillaceous and silty	8708 - 8727
23	Limestone, very fine, clastic, very dark-gray, argillaceous, silty, and somewhat magnesian	8727 - 8750
<u>Chazy group, 87 feet</u>		
<u>Loysburg formation, 87 feet</u>		
<u>Clover limestone, 37 feet</u>		
27	Limestone, sublithographic, brownish- to dark-brownish-gray, somewhat argillaceous, silty, and magnesian	8750 - 8777
10	Limestone, sublithographic, dark-brownish-gray, slightly argillaceous and magnesian	8777 - 8787
<u>Bottom of Clover Limestone</u>		
15	Limestone, very fine, clastic, dark-brownish-gray, somewhat argillaceous, silty, and magnesian	8787 - 8802
15	Limestone, very fine, clastic, dark-gray, argillaceous and somewhat magnesian	8802 - 8817

Thickness Feet	Description of Strata	Depth in feet
10	Limestone, sublithographic, dark-brownish-gray, somewhat argillaceous and magnesian, with a little interbedded very fine, clastic, light-brownish-gray, dolomitic limestone	8817 - 8827
10	Limestone, very fine, clastic, brownish-gray, dolomitic and somewhat argillaceous, with considerable interbedded sublithographic, dark-brownish-gray, somewhat argillaceous and magnesian limestone	8827 - 8837
<u>Lower Ordovician or Canadian Series, 142+ feet</u>		
<u>Bellefonte dolomite, 142+ feet</u>		
26	Limestone, very fine, clastic, gray, argillaceous and dolomitic	8837 - 8863
7	Limestone, very fine, clastic, dark-gray, argillaceous and dolomitic; <u>estimated I.O.F. of 600,000 cubic feet of SOUR GAS per day at 8870 feet, exhausted before well was completed</u>	8863 - 8870
23	No samples	8870 - 8893
12	Limestone, very fine, dense, brownish- to dark-brownish-gray, dolomitic	8893 - 8905
11	Limestone, very fine, dense, brownish-gray, dolomitic and somewhat argillaceous	8905 - 8916
4	Limestone, very fine, dense, brownish- to dark-brownish-gray, argillaceous and somewhat magnesian	8916 - 8920
18	Limestone, very fine, dense, brownish- to dark-brownish-gray, dolomitic and somewhat argillaceous	8920 - 8938
2	Dolomite, very fine, clastic, dark-brownish-gray, argillaceous	8938 - 8940
6	Dolomite, very fine, clastic, light-brownish to brownish-gray, somewhat argillaceous and silty	8940 - 8946

Thickness Feet	Description of Strata	Depth in feet
2	Dolomite, very fine, clastic, dark-gray, somewhat argillaceous	8946 - 8948
6	Dolomite, very fine, clastic, brownish- to dark-brownish-gray	8948 - 8954
2	Limestone, very fine, clastic, dark- to dark-brownish-gray, dolomitic and somewhat argillaceous and silty	8954 - 8956
2	Limestone, very fine, dense, light-brownish-gray, magnesian, containing some anhydrite	8956 - 8958
3	Limestone, very fine, sublithographic, light-brownish- to brownish-gray, dolomitic	8958 - 8961
7	Limestone, very fine, clastic, gray, dolomitic, argillaceous, and silty	8961 - 8968
9	Limestone, very fine, clastic, brownish- to dark-brownish-gray, dolomitic, somewhat argillaceous, and slightly silty	8968 - 8977
2	Limestone, very fine, sublithographic, very dark-brownish-gray, dolomitic, slightly argillaceous	8977 - 8979
TOTAL DEPTH		8979

